Code No.2892/AICTE/S

FACULTY OF ENGINEERING

B. E. (Civil) III – Semester (AICTE) (Supplementary) Examination,

November 2020

Subject: Surveying & Geomatics

Time: 2 hours **Max. Marks: 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5 x 2 = 10 Marks)

1. The magnetic bearing of a line is $143^0 30'25"$. What is the true bearing of the line if the magnetic declination is $1^0 45'15"$ W?
2. Describe the method of radiation in plane table surveying.
3. What is the least of count of a transit theodolite?
4. Name the sources of errors in theodolite survey.
5. With a neat sketch explain first tangent and second tangent.
6. What is a compound curve?
7. Name the applications of a total station.
8. Write trapezoidal rule.
9. Give any four applications of remote sensing to civil engineering problems.
10. What is terrestrial photogrammetry?

PART – B (4 x 15 = 60 Marks)

11. The following readings were observed successively with level, the instrument having been moved forward after the second, fourth and eighth readings. 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030, 3.765. The first reading was taken with the staff held upon a B.M of elevation 132.135. Determine the R.L's, apply the usual check. Find also the difference in level between first and last points.
12. Find the elevation of the top of a chimney and distance of chimney from the following data:

Instrument Station	Reading on B.M.	Angle of elevation	Remarks
A	0.862	$18^0 36'$	R.L of B.M. = 421.380m
B	1.222	$10^0 12'$	Distance AB=50m

Station A and B and the top of the chimney are in the same vertical plane.

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13. Calculate the data necessary for setting out a 6^0 curve by tangential deflection angles method between two tangent lines BA and BC if the included angle ABC is 142^0, chainage of B is 1288m, peg interval is 30m.

14. (a) Explain the applications of Total station.

    (b) Explain the advantages of Total station.

15. What is aerial photogrammetry? What are its principles? What are the different types of photographs?

16. The following bearing were taken in running a compass traverse.

Line	F.B	B.B
AB	$124^0 30'$	$304^0 30'$
BC	$68^0 15'$	$246^0 0'$
CD	$310^0 30'$	$135^0 15'$
DE	$200^0 15'$	$17^0 45'$

At what stations do you suspect local attraction? Find the correct bearings of the lines and also compute the included angles.

17. (a) Explain the procedure for measuring horizontal angles by repetition method.

    (b) Write short notes on Remote Sensing data acquisition.

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Code No: 2893/AICTE/S

FACULTY OF ENGINEERING

B.E. III-Semester (AICTE) (EEE) (Suppl.) Examination, November 2020

Subject : Electrical Circuit Analysis

Time: 2 Hours **Max. Marks: 70**

Note: Answer any five questions from Part – A & any four questions from Part-B.

PART- A (5x2 = 10 Marks)

1. Given the phasor voltage $V = 115\sqrt{2}\angle 45^0\ V$ across an impedance $Z=16.26\angle 19.3^0\Omega$, obtain an expression for the instantaneous power, and compute the average power if ω=50rad/s.
2. If $I=2.5\angle -15^0$ A in the below circuit, then find the value of 'Z'.

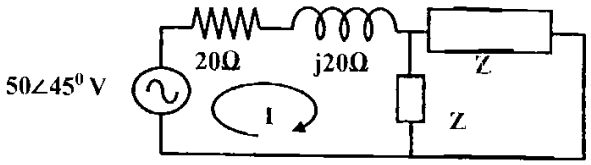
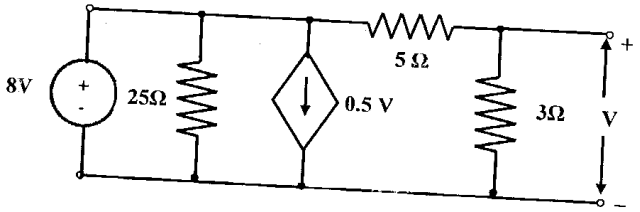


Fig.1

3. For the circuit shown in Fig.2 find the current flowing through 5Ω resistor.



4. State Maximum Power Transfer theorem for a.c. circuits.
5. An exponential voltage V (t) = $16e^{-4t}$ volts is applied to series RL circuit with R = 1Ω and L = 0.2H. Find the response i(t) assuming initial charge to be zero.
6. A 0.2H inductor is in parallel with a 100Ω resistor. The inductor current is 4 A at t=0. Find inductor current $i_L(t)$ at t=0.8ms.
7. Using the initial and final value theorems where they apply, find $f(0^+)$ and $f(\infty)$ for the following function F (S) = $\frac{(S+3)(S+2)}{(S+3)(S+4)}$.
8. Find the inverse laplace transform of I (S) = 2log $\left(\frac{S+2}{S}\right)$
9. Determine the impedance parameters of the Two Port network shown in Fig.3

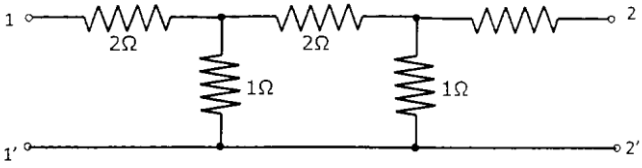


Fig.3

10. When a network is said to be symmetrical and reciprocal with respect to transmission parameters?

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PART- B (4x15 = 60 Marks)

11. A balanced three phase three wire system is terminated with two Δ connected loads in parallel. Load 1 draws 40kVA at a lagging PF of 0.8, while load 2 absorbs 24kW at a leading PF of 0.9. Assume no line resistance and let V_{ab} = 440 $\angle$ 30^0 V. Find a) the total power drawn by the loads b) the phase current I_{ABI} for the lagging load c) I_{AB2} d) I_{aA}.

12. Sate Norton's Theorem. Determine the voltage across inductor for the circuit shown in Fig.4 using Norton's theorem.

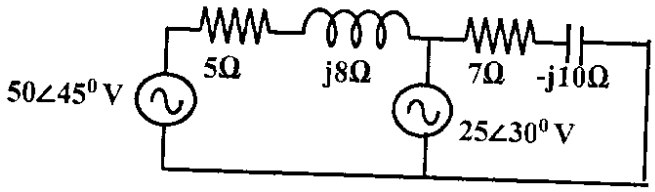


Fig.4

13. For the network shown in Fig.5 the switch k is changed from position a to b at t=0. Solve for

i, $\frac{di}{dt}$ and $\frac{d^2i}{dt^2}$ at $t = 0^+$ if $R = 1000\ \Omega, L = 1H, C = 0.1\ \mu.$ and $V = 100V.$

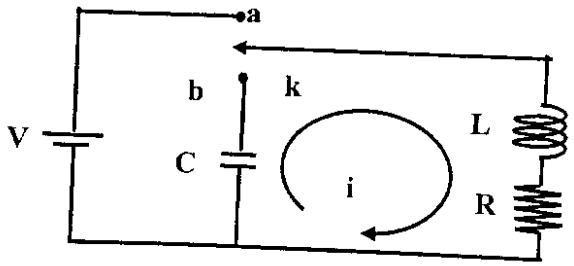


Fig.5

14. For the RC network shown in Fig. 6b is energized with an input voltage shown in Fig. 6a Fin f i(t).

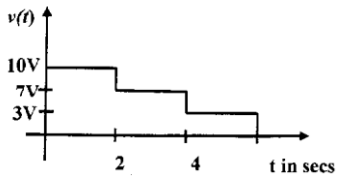


Fig. 6a

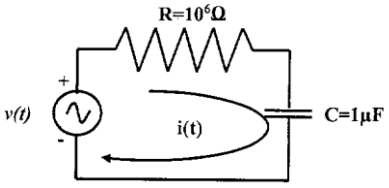


Fig.6b

15. Determine the impedance, parameters for the network shown in Fig.7

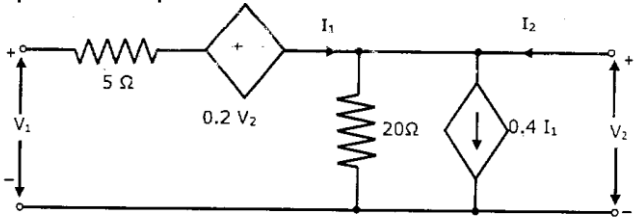
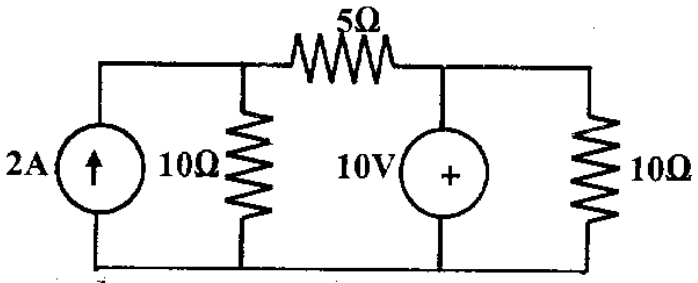


Fig.7

16. a) A series resonant network consists of a 50Ω resistor, a 4-mH inductor, and a 0.1 μ F capacitor. Calculate values for a) resonant frequency in rad/sec

b) resonant frequency in Hz. C) Quality factor d) Band width e) cut off frequencies.

b) Obtain the value of current through the 5Ω resistor shown in Fig.8 by using super position theorem.



17. a) Two coils, of self-inductances L_1=2H, L_2=4H are coupled in such a way that M=1.5H. Assuming the mutual inductance to be +ve as per the dot convention, find the amount of energy stored 0.2 sec for the circuit connected to a d.c. source of 12V.

b). The network shown in Fig.9 reaches a steady state with the switch k closed. At time t=0 the switch is opened. Determine v1 and v2 at $t = 0^+$.

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Code No. 2904/AICTE/S

FACULTY OF ENGINEERING

B.E. (ECE) III-Semester (AICTE) (Suppl.) Examinations, November 2020

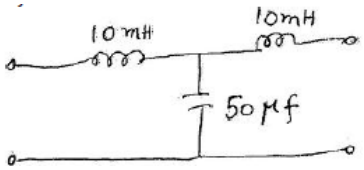
Subject : Network Theory

Time: 2 Hours **Max. Marks: 70**

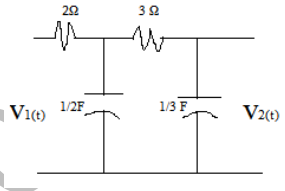
Note: Answer any five questions from Part-A. Answer any four questions from Part-B

PART- A (5 x 2 = 10 Marks)

1. State and Explain Reciprocity Theorem.
2. Express Y-Parameters in terms of Z-parameters.
3. Define Image transfer constant and Iterative transfer constant of Asymmetrical network.
4. Prove that $Z_o = \sqrt{Zoc.Zsc}$ in Symmetrical network
5. Find the cut-off frequency for the filter below

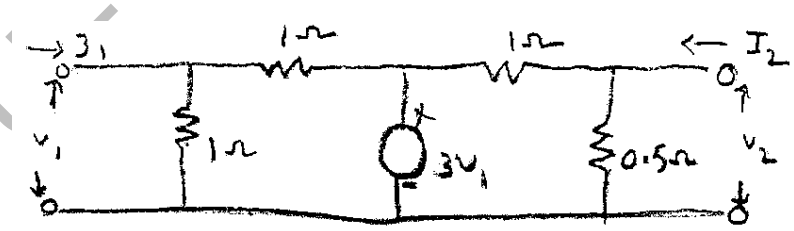


6. List the advantages of m-derived filters over constant-K filters?
7. Design shunt equalizer producing 10dB attenuation at 40KHz having 400Ω Ro.
8. Design Asymmetrical **L** attenuator working between 200Ω & 700Ω.
9. List properties of Positive Real Function.
10. Calculate the $G_{12}(s)$, $\alpha_{12}(s)$ of the network given below.



PART- B (4 x 15 = 60 Marks)

11. a) Find the Z- parameters of the resistive network shown below.



b) What is the condition for symmetry and reciprocity in terms of ABCD parameters?

What is the advantage of using ABCD parameters?

12. a) Calculate the image and iterative impedances of a T-network with series impedances **Z_1=30+j7.5** Ω, **Z_2= 50+j10** Ω and shunt arm impedance **Z_3=j3229** Ω respectively.

b) Following measurements were done on a particular network. Z_{1o} =1260 ∟30; Z_{1s}= 318 ∟72; Z_{2o}= 2430 ∟-34; Z_{2s} =613∟ 8 .Determine the following on Both ends (i) Image impedances on both ends (ii) Propagation Constant.

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13. a) Design a composite High pass filter with a cut-off frequency of 15 KHz and a nominal impedance of 600Ω with frequency of infinite attenuation is 14 KHz.
    b) Justify that m=0.6 for m-derived terminating half section.

14. a) Design a full shunt equalizer producing 19dB attenuation at 10^3 rad/sec Having characteristic resistance of 1k Ω such that attenuation increases with increased frequency.
    b) Design a L attenuator having design impedance of 1k Ω and provides an attenuation of 18dB.

15. a) Obtain second Cauer form for the LC immittance function Z(s) = $\frac{s^4+4s^2+3}{s^3+2s}$.
    b) Synthesize the first foster forms of $z(s) = \frac{(s^2+2)(s^2+4)}{s(s^2+3)}$.

16. a) Determine the arm resistances of the symmetrical lattice attenuator having an attenuation of 20dB and the characteristic impedance of 500 Ω.
    b) Explain Filter performance with graph.

17. Write short notes on
    a) Notch Filter.
    b) Phase Equalizer.
    c) Inverse networks.

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Code No: 2914/AICTE

FACULTY OF INFORMATICS

B.E. III Semester (AICTE) (I.T) Examination, November 2020

Subject : Data Structures

Time : 2 Hours **Max. Marks : 70**

Note : Answer any five Questions from Part-A & any four Questions from Part-B

PART – A (5 x 2 = 10 Marks)

1. What is time and space complexity of an algorithm?
2. What are templates in C++?
3. What is exception handling in C++?
4. What are sparse matrices?
5. What are the advantages of doubly linked list over singly linked list?
6. What is hash function?
7. What is inheritance in C++?
8. How linear queue is different from circular queue?
9. What is graph? Give an example.
10. Briefly explain insertion sort.

PART – B (4 x 15 = 60 Marks)

11. a) What are asymptotic notations explain with examples?

    b) What are constructors, list types of constructors in C++?

12. a) Define ADT

    b) Write a C++ program for implementing a string as an ADT.

13. a) Explain the pop and push operations on a stack with example.

    b) Explain the dequeue () and and enqueue() operations on a queue with example

14. a) What is singly linked list explain the insert operation on singly linked list in following order 5,7,1,2,9,4,3

    b) Explain different hash functions?

15. a) What are binary tree traversals explain with example?

    b) What is binary search tree explain with example?

16. Sort the following list using quick sort 26,5,77,1,61,11,59,15,48

17. a) Explain DFS with an example.

    b) Write Krushkal's algorithm and explain with an example.

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Code No: 2918/AICTE/S

FACULTY OF ENGINEERING

B.E. III Semester (AICTE) (CSE) (Suppl.) Examination, November 2020

Subject: Operations Research

Time: 2 Hours **Max. Marks: 70**

Note: Answer any five questions from Part – A & any four questions from Part – B

PART – A (5 x 2 = 10 Marks)

1. What are the advantages and disadvantages of Operations research models?
2. What is meant by a feasible solution of an LPP?
3. What is the significance of dual variables in a LP model?
4. State various steps involved in dual simplex algorithm.
5. What is assignment problem? Give two applications.
6. Explain the method to solve an unbalanced transportation problem.
7. What are the assumptions made in theory of games?
8. Describe some important replacement situations.
9. Define
   (a)Reneging
   (b) Balking
   (c) Jockeying
10. What is no passing rule in sequencing algorithm?

PART – B (4 x 15 = 60 Marks)

11. Max $Z = X_1 + 4X_2 + 5X_3$

    STC $3X_1 + 3X_2 \leq 22$

    $X_1 + 2X_2 + 3X_3 \leq 14$

    $3X_1 + 2X_2 \leq 14$

    $X_1, X_2, X_3 \geq 0$

12. Use dual simplex method to solve following LPP

    Min $Z = X_1 + 2X_2 + 3X_3$

    STC $X_1 - X_2 + X_3 \geq 4$

    $X_1 + X_2 + 2X_3 \leq 8$

    $X_2 - X_3 \geq 2$

    $X_1, X_2, X_3 \geq 0$

13. Determine minimum transportation cost.

	Customer					
Warehouse	55	30	40	50	40	40
	35	30	100	45	60	20
	40	60	95	35	30	40
	25	10	20	30	15	

14. Determine optimum assignment schedule.

31	62	29	42	15	41
12	19	39	55	71	40
17	29	50	41	22	22
35	40	38	42	27	33
19	30	29	16	20	23
72	30	30	50	41	20

15. The cost per year of running a vehicle, whose purchase price is Rs 50, 000 is given below. Running cost increases by Rs. 2000, but resale value remains constant at Rs. 2000. At what age is the replacement due?

Year	1	2	3	4	5	6	7
Running cost	5000	6000	7000	9000	11500	16000	18000
Resale value	30000	15000	7500	3750	2000	2000	2000

16. Determine a sequence for the jobs that will minimize the elapsed time.

Job	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Machine A	3	8	7	4	9	8	7
Machine B	4	3	2	5	1	4	3
Machine C	6	7	5	11	5	6	12

17. Write short notes on
    a) MPSO technique
    b) Genetic Algorithm
    c) Pure strategy in game theory

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Code No: 2896/AICTE/S

FACULTY OF ENGINEERING

BE III Semester (AICTE) (Inst) (Suppl.) Examination, November 2020

Subject: Network Theory

Time:2 Hours **Max Marks: 70**

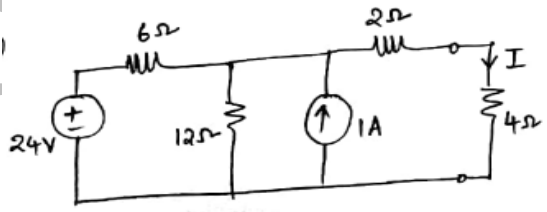
NOTE: Answer any five questions from Part-A & Any four questions from Part-B

PART – A (5 x 2 = 10 Marks)

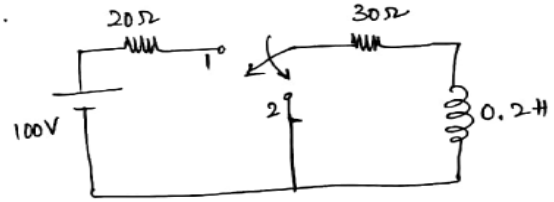
1. What are the Dependent and Independent Sources?
2. State Norton's Theorem and draw its equivalent circuit?
3. Define Impulse function?
4. Define Initial and Final value theorem.
5. For a series R-L circuit R=10Ω & C=100μF. Determine impedance of the circuit?
6. Define Power factor.
7. Define Self Inductance and Mutual Inductance.
8. For a series RLC circuit R=5Ω, L=100mH & C=10μF. Determine resonant frequency of the circuit.
9. Write the generalized equations of ABCD parameters of a two port network.
10. For a two port network, Y_{11} = 15℧, Y_{12} = Y_{21} = 10℧ & Y_{22} = 20℧. Determine Y-parameters.

PART – B (4 x 15 = 60 Marks)

11. (a) State Super Position Theorem.
    (b) Determine the current 'I' using Norton's Theorem.



12. For the circuit shown in fig., Find the current equation when the switch 'S' is changed from position1 to position2 at t = 0.



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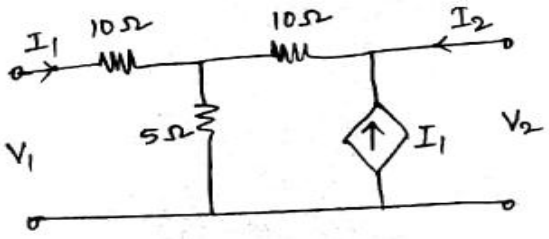
13. A circuit consists of three branches connected in parallel. One branch is having a pure resistance of 10Ω. The second branch is having an inductive reactance of 15Ω and the third branch consists of capacitive reactance of 20Ω. If 230V, 50Hz is connected across the circuit then find the total current and current in each branch.

14. (a) Show that 2-wattmeters are sufficient to measure 3-ϕ power with neat diagram

    (b) Define the following:
    (i) Resonant frequency
    (ii) Bandwidth
    (iii) Q-factor
    (iv) Selectivity
    (v) Magnificence of resonance for a series R-L-C circuit.

15. Determine Z-parameters of a given two port network?



16. (a) Classify and explain Coupled circuits.
    (b) Derive ABCD parameters for cascade 2-port network in terms of Z - parameter.

17. (a) State and explain Maximum Power Transfer theorem.
    (b) Derive Average and RMS value for sine waveform.

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